Serial No. 09/850,183
Reply to Office Action of January 14, 2005

Amendments to the Drawings:

The attached sheet of drawings includes changes to Fig. 5. Fig 5 was originally filed as an informal drawing with handwritten element numbers. The attached sheet includes Fig. 5 in formal form and replaces the original sheet including Fig. 5. An annotated sheet is not believed necessary to explain the changes and is not presented with this Amendment.

REMARKS/ARGUMENTS

Prior to this Amendment, claims 1-19 were pending in the application.

Claim 1 is amended to further distinguish the claimed availability model from the teaching of the cited references including defining particular classes of software failures that are modeled and are not shown in the references. No new matter is added for this amendment with support found in para. [0028].

Independent claims 8 and 18 are amended to clarify the terms "warm recoverable errors" and "non-warm recoverable errors" based on Applicant's specification beginning at para. [0028]. Dependent claims 9-12 are amended to better define "fraction" as being determined by dividing a number greater than or equal to zero by a number greater than or equal to one and to provide more clear antecedent basis (e.g., by removal of "software" before "errors").

Independent claims 16 and 19 are amended to include the limitations of dependent claim 17, which are not shown by the cited references. Claim 17 is canceled.

Claims 1-16, 18, and 19 remain in the application for consideration by the Examiner.

Drawing Objections

In the Office Action Response to Arguments, the Examiner indicated that Figure 5 was objected to by the Examiner as being informal. A replacement sheet is provided to present a formal Figure 5.

Claim Rejections Under 35 U.S.C. §112

In the Office Action, claims 8-15, 17, and 18 were rejected under 35 U.S.C. §112, second paragraph as being indefinite. Independent claims 8 and 18 are amended to include the definitions of warm and non-warm recoverable errors for software components as provided in para. [0028] of Applicant's specification (and more fully described in the paragraphs following para. [0028]). Dependent claims 9, 11, and 17 are amended to better define "fractions" to be real numbers determined by dividing a number greater than or equal to zero by a number greater than or equal to one. Each of the fractions is believed defined by the definiteness required by 35 U.S.C. §112, second paragraph, by the limitations of these claims including full definitions of the numerators and denominators of the fraction.

Claim Rejections Under 35 U.S.C. §102

In the Office Action of January 14, 2005, claims 1-5, 16, and 19 were rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Pat. No. 6,393,386 ("Zager"). This rejection is traversed based on the following remarks.

Claim 1 is amended to clarify that the availability model includes aggregated failure rates for each of a set of classes of failures for a software component in a computer platform. More particularly, claim 1 is amended to specify what types of specific failure classes may be included and modeled with aggregated failure rates. The Examiner responded to Applicant's prior reasons for allowing claim 1 in paragraphs 16-29. Applicant has reviewed these paragraphs in detail and has reviewed the cited portions of Zager. However, none of this discussion nor any citations to Zager discuss the specific software failure or error classes now claimed as being modeled by aggregated failure rates in claim 1. In paragraph 19 and 20, the Examiner asserted that such separation into classes would be inherent in modeling because Zager teaches different faults. However, Zager only teaches root and non-root fault classifications and such a classification is not inherently useful with software application errors and is different than that claimed in claim 1. For this reason alone, claim 1 is not anticipated or even suggested by Zager.

Applicant would also restate the reasons for allowing claim 1 over Zager presented in the last Amendment and address Examiner's traversing arguments. A major thrust of Applicant's arguments was that the availability model included aggregated failure rates for each of a set of classes of failures of software components. The Examiner cites one passage in Zager (col. 11, lines 9-16) for teaching aggregation of failure rates for classes of software failures. However, this citation merely states that categorization of service allows a model to cut across different service providers to provide an aggregation of fault and impact data for a service.

There is no teaching here or elsewhere in Zager that failures for a software component should be placed into a set of classes, that failure rates for each class should be determined for each software component in the class, and the rates then aggregated as called for in claim 1. Instead, Zager teaches categorization by service should be done and that the service's fault and impact data can then be aggregated, which is a very different operation as "a service" is not defined by Zager to be a class of software failures (or the specific classes now included in claim 1),

see, for example, Zager beginning at col. 9, line 55. Because Zager fails to teach classifying failures of software components or aggregating the failure rates for each class, claim 1 is not shown or suggested by Zager, and the rejection should be withdrawn.

For the sake of completeness, it may be useful to repeat the reasons for allowing claim 1 provided in the last Amendment as they are still believed applicable.

> "Regarding claim 1, the Office Action cites Zager at col. 11, lines 10-16 for teaching "the model includes an aggregate failure rate and aggregate repair time for each said classes of failures in the form of aggregate fault and impact data." Applicant disagrees with this interpretation of Zager. Zager at this citation and elsewhere provides no discussion of determining an aggregate failure rate or an aggregate repair time for various classes of failures of a software component. Zager describes an "impact" at col. 11, lines 54-57 as "the description of a disruption in service for some portion or user A of the external system owing to a correlated disruption in service o some portion B. For instance, a database suffers sympathetically if a business application cannot reach it owing to router failure." An impact as defined by Zager differs from a failure rate and from a repair time and there is no suggestion that the "aggregate fault and impact data" would include a failure rate or repair time.
>
> Hence, there is no teaching or suggestion of a model that includes "an aggregate failure rate" for a set of failure classes for a software component or even the determination of a failure rate for one class of failures for such component. Further, Zager does not teach a model that includes a repair time for each class of failure for a software component or that these times should be aggregated for use in a software availability model. In other words, Zager does not discuss repair times for root causes, non-root causes, and performance degradation failures or aggregating such repair times (which apparently may be hardware or software based faults). For these reasons, Zager does not support an anticipation rejection of claim 1, and Applicant respectfully requests that this rejection be withdrawn."

Claims 2-5 depend from claim 1 and are believed allowable at least for the reasons for allowing claim 1. Further, the Office Action in rejecting claim 2 asserts that it is inherent to include platform parameters in an availability model. However, Zager fails to teach the software availability model as discussed with reference to claim 1, and further, there is no teaching that the platform parameters define platform problems causing failures and affecting recovery times related to the platform problems. Further, Zager does not teach that "at least a portion of the platform parameters are used to determine the aggregated repair time" with Zager not teaching the determination of such an aggregate repair time nor using platform parameters to determine it.

The response to arguments of paragraphs 30-35 addresses these reasons for allowing claim 2, but Applicant could find no discussion or citation in these paragraphs where Zager teaches using "platform parameters." The Examiner discusses pinging or monitoring for live data but no discussion is provided for using parameters of the system to model faults (e.g., see paragraph 33 of the response to arguments which discusses obtaining current states of components but not using system parameters as defined in Applicant's specification). Hence, Zager fails to teach each element of claim 2, and the rejection should be withdrawn.

In rejecting claim 4, the Office Action cites col. 2, line 64 to col. 3, line 3 stating that teaches monitoring a network so it must be inherent to include time to detect and identify an error as part of a repair time. Again, Applicant disagrees that Zager ever teaches or suggests tracking and determining the repair time for a software component or aggregating such repair times. Further, it is not inherent that even if repair time is measured that it would include time to detect and identify such a fault or failure. At col. 2, line 64 to col. 3, line 3, Zager is merely discussing an object of its invention is to be able to understand "impacts" within a networked system but provides no teaching of determining repair times of a software component or what that may entail. For these additional reasons, Zager does not support a rejection of claims 2 and 4.

The response to arguments in paragraphs 22-24, the Examiner cited Newton's Telecom Dictionary for teaching "mean time to repair" but provided no citation in this reference or elsewhere (such as in Zager) of actually determining a time to detect and identify an error associated with running a software component on

a particular platform or of aggregating such times in an aggregated repair time. Hence, claim 4 is not shown by the references of record.

Regarding claim 16, the first Office Action cited Zager for teaching "a failure rate and recovery rate is determined for said event" at col. 3, lines 36-47. Zager at this citation fails to teach determining a failure rate or a recovery rate for a software error, and instead teaches gathering information about what components are in a network, what services are provided by the various components, and gathers information on malfunctions or performance degradation, and likely "impacts" on the system. However, as discussed relative to claim 1, Zager does not teach that "impacts" include a failure rate for a particular software error and does not teach determining the recovery rate from such software error. "Impacts" as used by Zager has to do with one service being affected by the degradation or unavailability of another service or component (e.g., cannot access a database when a router is out and the like). This is different than what is called for in claim 16, and this rejection should be withdrawn for at least this reason.

Further, the first Office Action stated that Zager at col. 3, lines 4-11 and 36-47 teaches incorporating the "event data" into the recoverable state data. However, as discussed above, the Zager event data does not include a failure rate or a recovery rate for a software error and therefore, cannot teach incorporating this into a previously determined recoverable state. As discussed at col. 3, lines 4-11, Zager teaches that the object of the Zager method is to model service relationships connecting resources in a network to show the current make-up of the network but does not teach modeling a software error to include determining failure rate and recovery rate for the error and then incorporating these rates into a recoverable state. For this additional reason, Zager fails to anticipate or even suggest the method of claim 16.

Claim 16 has been amended to include the limitations of claim 17. The first Office Action and the response to arguments of the January 14, 2005 Office Action fail to indicate where Zager or the other references teach determining the fraction of recovery failures. Hence, the references cannot teach incorporating such a fraction value in a recoverable state as part of modeling a software error. For these additional reasons, the rejection of claim 16 is improper and should be withdrawn.

Claim 19 is directed to a computer program product with limitations, and the reasons provided for allowing claim 16 are believed equally applicable to claim 19.

Claim Rejections Under 35 U.S.C. §103

Further, in the Office Action, claims 6-15, 17, and 18 were rejected under 35 U.S.C. §103(a) as being unpatentable over Zager in view of an article entitled "Understanding Fault-Tolerant Distributed Systems" ("Cristian"). Claim 17 is canceled. The rejection of claims 6-15 and 18 is traversed based on the following remarks.

The response to arguments of paragraph 39 reiterates much of the arguments provided for claim 1, and Applicant believes the reasons provided for allowing claim 1 are applicable to claim 6. Also, the response to arguments states that Zager clearly teaches an aggregation of reliability data." Applicant disagrees that Zager teaches a model having "an aggregated failure rate and an aggregated repair time for each software component" on a node in a network being modeled. Applicant requests that the Examiner provide a specific citation in Zager or elsewhere of such modeling. Zager teaches aggregating failure and impact data across services not for each software component as called for in claim 6. For this reason alone, each element of claim 6 is not shown or suggest by these references.

To further support allowance of claim 6, Applicant presents his reasons for allowance provided in the last Amendment.

> "With regard to claim 6, the Office Action cites Zager (as with claim 1) for teaching a software availability model that includes an aggregated failure rate and an aggregated repair time for each software component. This teaching is said to occur at col. 11, lines 11-16 by "categorization of reliability according to service." Categorization does not require including failure rates for software components on a node and aggregated values of such rates in a software availability model and also, does not teach including repair times for the software components as an aggregated value. As discussed in Applicant's specification, the failure rates and repair times may vary widely and aggregation allows a single value to be used in a model. Zager fails to teach the software availability model of claim 6, and at the portion cited in the Office Action, Zager teaches aggregating fault and impact data for a service but, again, the impact data is different than called failure rates and repair times, and how reliable a database service is for a "given set of disparate users" does not teach the software availability model of claim 6. Cristian is not cited to overcome this deficiency in Zager but is cited for other teachings.

Hence, Applicant requests that the rejection of claim 6 based on Zager and Cristian be withdrawn because each and every element is not shown or suggested."

Claim 7 depends from claim 6 and is believed allowable as depending from an allowable base claim.

Independent claim 8 is amended to clarify the meaning of warm recoverable errors and non-warm recoverable errors. Neither Zager nor Cristian provide teaching of determining failure and recovery rates for these particular classes of software errors. The Office Actions have generally construed these limitations as "software errors" and read the limitations out of the claims (or given them no patentable weight). Applicant believes that since the references of record do not show or suggest such classification of software errors or determining failure rates or recovery rates for such software error classes claim 8 is in condition for allowance.

Further, the following reasons for allowing claim 8 that were presented in the prior Amendment are believed by Applicant to distinguish the claimed method.

> "Regarding independent claim 8, the Office Action cited Zager for teaching predicting impacts of faults and modeling recovery. However, at the cited lines 4-11 of col. 3, Zager is merely stating its objective to model changes in the make-up of a network. The "impacts" of faults, as discussed earlier, is defined in Zager as the effect a fault or degradation of a service or component has on other services or components within a network. This does not, however, teach determining failure rates and recovery rates, and certainly not for warm recoverable and non-warm recoverable errors of a software component as called for in claim 8. Cristian is not cited for, and cannot, address this deficiency in Zager. Hence, the rejection of claim 8 is not supported by the combined teachings of Zager and Cristian, and the rejection should be withdrawn."

Claims 9-15 depend from claim 8 and are believed allowable as depending from an allowable base claim.

Conclusions

In view of all of the above, Applicant requests that a timely Notice of Allowance be issued in this case.

No fee is believed due for this submittal. However, any fee deficiency associated with this submittal may be charged to Deposit Account No. 50-1123.

Respectfully submitted,

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Enclosure: Replacement Sheet for Figure 5